THE DETERMINANTS OF PRIMING AND CAMPAIGN STRATEGY WORK IN PROGRESS

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Abstract. When, and to what extent, do candidates use priming as a campaign strategy? Priming changes issue salience, and salience is a major determinant of elections, so candidates have incentives to prime certain issues to influence the outcome of elections and equilibrium policy. I examine the problem of optimal priming in a spatial campaign-election model with image and policy dimensions, in which one candidate, the incumbent, has an image advantage. Each candidate's campaign implies the salience of image relative to policy; citizens believe neither, one, or both campaigns (in the sense that they evaluate candidates weighted by those relative salience levels) according to a probability distribution that depends on their pre-campaign salience and the salience implied by each campaign. I show that under reasonable conditions, the incumbent always primes image over policy, and the challenger always primes policy over image (even if he does not have an absolute advantage in policy either). In addition, I show comparative static results that, along with the overall behaviour, shed new light on the problem of priming and campaign effects.

1. Introduction

The results of priming research are not surprising: political candidates spend a disproportionate amount of campaign time priming favourable issues [Druckman et al., 2009]. Priming changes issue salience, and salience is a major determinant of elections, so candidates have incentives to prime certain issues to influence the outcome of elections and equilibrium policy. But why don't they focus solely on the most favourable issue? Before we can answer that, we need answers to two questions: what do campaigns do? Given campaign effects, what determines campaign priming decisions? To answer these questions, I start with three basic elements: candidates, citizens, and campaigns.

I examine an election in which there are two candidates, an incumbent and a challenger, each seeking to maximize the expected number of votes he receives in the election. There are two issues in the election: image quality (which can be thought of as some combination of personality, charisma and performance) and policy. The incumbent has an advantage in image quality (also called a valence advantage in political economy literature [Groseclose, 2001, Aragones and Palfrey, 2002][1], though if an incumbent experiences a strong negative economic or social event, the challenger could have the advantage [Petrocik, 1996]), and

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[1]Although those models include campaign funds and name recognition in measures of valence, my use of image quality is closer to personal character valence, based on the premise that personal character is of intrinsic value to voters, while fundraising characteristics and effective campaign managers are not [Stone and Simas, 2010].

since I want to isolate campaign priming effects, I fix each candidate's policy position in order to abstract from policy determination. Fixed policy positions could be considered a preference for policies based on party or personal ideology [Grossman and Helpman, 1996], or a commitment to past political platforms, a view supported by the documented U.S. congressional campaign strategy of running on voting records [Sellers, 1998].

Citizens have preferences that are increasing in image quality and single-peaked in policy, and weighted by issue salience. They have pre-campaign salience levels, known to candidates via public and private polls [Jacobs and Shapiro, 1994]. Candidates can affect citizen issue salience during the campaign by priming different issues. Priming is sometimes known as, or closely related to, agenda setting [Miller and Krosnick, 2000], emphasis framing [Druckman, 2011], and issue ownership [Petrocik, 1996]. However, citizens' ideal policies are not subject to persuasive arguments, because campaign policy debates and arguments serve only to reinforce existing ideological and policy perspectives of citizens [Taber and Lodge, 2006]. Their reactions to arguments for any policy position are affectively charged by previous experience and feeling [Lodge and Taber, 2005], and that affective charge results in instantaneous evaluation that is congruent with prior preference. Although the existence of confirmation bias and attitude polarization is still debated (e.g., [Luker, 1985, Conover and Feldman, 1984]), I only require that confirmation bias exists to the point that persuasive arguments are ineffective during the campaign, at which point citizens have already evaluated the relative arguments and have concrete ideal policies. Political economy literature generally ignores salience in voting models [Davis et al., 1972], with the exception of Roemer [Roemer, 1998], who assumes salience is exogenous and analyzes the impact of salience on electoral outcomes.

Campaign effects have been debated over many decades, but the literature has gradually progressed past minimal effects Berelson et al. [1954], Campbell [1960] and activation models (e.g., [Finkel, 1993] in order to include more complex stories of behaviour (see [Shaw, 1999] or [Hillygus and Jackman, 2003] for a review), including framing [Druckman et al., 2004, Hetherington and Rudolph, 2008, Barker, 2005, Nelson et al., 1997, Jacoby, 2000], issue ownership [Petrocik, 1996, Petrocik et al., 2003] and agenda setting [Gelman and King, 1993, Sides, 2006, 2007][2]. In this paper, they serve mainly to communicate each candidate's platform, but they also help define the relative salience that citizens assign to platforms, by spending relatively more or less time, effort and money on each issue. A candidate that spends more campaign time on an issue increases the implied salience of that issue. Of course, citizens have pre-campaign beliefs about salience, and the interaction between the salience implied by a candidate's campaign and citizens' pre-campaign salience changes the probability that any given voter will evaluate both candidates' platforms under that implied salience level [Druckman et al., 2004].[3] I take a narrow view of official campaigning in order to simplify the problem, since the development of "permanent campaigns" [Blumenthal,

[2]Although Gelman provides conflicting evidence for this idea—changing salience on fundamental variables, e.g., policy or economic performance, explains variation in polling behaviour over time, but could be due to voters receiving increasingly more information from the campaign until election day. However, he recognizes that campaign strategy and salience are endogenously determined.

[3]Druckman also introduces the novel strategy of priming image by issue, in which Nixon only used Vietnam to promote his image as a strong foreign policy leader during the .

1982] renders campaign effects that much more complex. Of course, the media have a substantial role in determining issue salience and help jointly determine campaign effects and election outcomes. However, I assume either there are no media in the model, particularly in the determination of campaign salience, for example, by measuring implied salience by the percentage of content devoted to an issue by the candidate's campaign website [Druckman et al., 2009]. Although candidates and media still interact, the media have no direct involvement in the creation and dissemination of material on the candidate's website. In addition, although campaign spending has effects on some elections [Jacobson, 1990], the addition of campaign spending should not alter the incentives and tradeoffs I analyze in order to determine priming behaviour.

The incumbent then faces a tradeoff: by increasing the salience citizens put on image quality, he can increase the number of citizens who would prefer him if they evaluated both platforms under that salience level. But by proposing salience levels that deviate too much from citizens' pre-campaign salience, he risks losing citizens that will believe the challenger's campaign, and possibly switch their vote based on the new salience levels, or stop voting altogether. However, under reasonable conditions, both the incumbent and challenger prime their relatively favourable issues: the incumbent spends more campaign time on image quality than suggested by pre-campaign salience, and the challenger spends less. In addition, an increase in incumbent image quality, or decrease in challenger image quality, increases priming for both candidates, and a increase in policy difference decreases priming for both candidates. An increase in average policy decreases priming for the incumbent and increases priming for the challenger.

This simple mathematical model presents a theoretical explanation for the determinants of priming behaviour, as well as comparative statics results and testable empirical implications, in order to complement and qualify existing theoretical and empirical work on priming.

2. Model

There are two groups of agents, citizens and candidates. Candidates communicate to citizens through the campaign, citizens communicate to candidates with a vote. Citizens evaluate platforms based on image characteristics and policy positions, weighted by issue salience, although salience may be affected by the campaign. Candidates' policy and image characteristics are fixed, and they communicate salience through the campaign in order to maximize the expected number of votes they receive in the election. Each candidate's platform is a pair (x, y) drawn from the set $[0, 1]^2$, where x is the candidate's image characteristic, and y is the candidate's policy platform.

2.1. **Candidates.**

There are two candidates, labelled A and B, each with fixed policy and image pairs (x_A, y_A) and (x_B, y_B). I assume $x_A > x_B$ and $y_A < y_B$, so that candidate A has an image advantage; in keeping with the literature, I will refer to candidate A as the incumbent (who has the image quality or valence advantage), and candidate B as the challenger. They seek to maximize the expected number of votes they receive by choosing salience values, (α_x, α_y), for each issue, by choosing how much time in their campaign to devote to each dimension. I assume candidates credibly commit to policy and have full information of the distribution of citizens' ideal policies.

2.2. **Citizens.** A citizen is represented by an ideal policy y_i. I assume the distribution of citizens (i.e., the distribution of ideal policies) is uniform on $[0, 1]$. Since utility is ordinal, only relative salience $\alpha = \alpha_x/\alpha_y$ matters, and thus utility is given by

$$u_i(x, y|\alpha) = -\alpha(1 - x)^2 - (y - y_i)^2, \tag{1}$$

a form of the standard spatial utility function for citizens, increasing in the image characteristic and decreasing in the distance from citizen i's ideal policy. Citizen i may choose not to vote, in which case he receives zero utility. Citizen i has pre-campaign relative salience defined by $\beta = \beta_x/\beta_y$. For simplicity, I assume β does not depend on individual i's preferences or ideology; in addition, citizens vote sincerely, not strategically.

2.3. **Campaign.** The incumbent's campaign is represented by α_A, representing the relative salience of image to policy, and a fixed image and policy platform (x_A, y_A). The challenger's campaign campaign is defined by α_B and (x_B, y_B). Now, consider the effect of the competing campaigns on citizen i (that is, a citizen with ideal policy i). With some probability he believes campaign A, in which case his utility is $u_i(x_A, y_A|\alpha_A)$. In general, call C_A the event that voter i believes campaign A, C_B the even that voter i believes campaign B. Then we must have, for each voter,

$$P(C_A^C \cap C_B^C) + P(C_A) + P(C_B) + P(C_A \cap C_B) = 1, \tag{2}$$

where the probability of event C_A is represented by $P(C_A)$. Then each citizen may believe both campaigns (the event $C_A \cap C_B$), one of campaigns A or B, or neither campaign (the event $C_A^C \cup C_B^C$). Citizen i then has salience α_A with probability $P(C_A)$, α_B with probability $P(C_B)$, β with probability $P(C_A \cap C_B)$, reflecting a belief or exposure to priming from both campaigns results in a return to pre-campaign salience levels [Sniderman and Theriault, 2004]. His relative salience is undefined otherwise (in other words, $\alpha_x = \alpha_y = 0$), and I assume he abstains, since he is indifferent between voting and not. Later, I will examine four different specifications for P.[4] I require the distribution of each $P(C)$ to have R-symmetry [Mudholkar and Wang, 2007, Chaubey et al., 2010], so that if the density function of $P(C)$ is $f_c(\alpha)$, then for $\beta \in [0, \infty]$, f_C satisfies

$$f_C\left(\frac{\beta}{\alpha}\right) = f_C(\beta\alpha).$$

This ensures that the probability of belief for candidate A if he chooses α is the same as the probability of belief for candidate B if B chooses $1/\alpha$. For example, if $(\beta_x, \beta_y) = (1, 1)$, the probability of a citizen believing the incumbent's implied salience of $\alpha_A = 2$ (i.e., $(\alpha_x, \alpha_y) = (2, 1)$) is the same as the probability of that citizen believing the challenger's salience $\alpha_B = 1/2$ (i.e., $(\alpha_x, \alpha_y) = (1, 2)$. The symmetry around the pre-campaign salience level ensures neither candidate has an inherent advantage in priming.

2.4. **Election.** The incumbent, candidate A, seeks to maximize the number of expected votes he receives by changing relative salience values α_A. In general, the number of expected

[4]For simplicity, I assume $P(A)$ does not depend on A's party identification or policy position, although this may not be the case (e.g., see [Hillygus and Jackman, 2003]).

votes candidate A receives is

$$(3)\quad V_A = \int_{i\in I} \Big(P(C_A)U_i(A > B|\alpha_A) + P(C_B)U_i(A > B|\alpha_B) + P(C_A \cap C_B)U_i(A > B|\beta) \Big) \mathrm{d}i,$$

where U_i is an indicator function for whether citizen i prefers (and votes for) one party over another, given certain salience values; formally,

$$U_i(A > B|\alpha) = \begin{cases} 1 & \text{if } u_i(x_A, y_A|\alpha) \geq u_i(x_B, y_B|\alpha) \\ 0 & \text{if } u_i(x_A, y_A|\alpha) < u_i(x_B, y_B|\alpha). \end{cases}$$

For any given citizen i, he votes for candidate A in three possible cases (the corresponding terms from left to right in Equation 3: candidate A's platform gives him a higher utility when he believes, with probability $P(C_A)$, the salience values α_A; or, candidate A's platform gives him a higher utility even when he believes, with probability $P(C_B)$, candidate B's campaign; last, citizen i votes for candidate A if A's platform gives him higher utility when, with probability $P(C_A \cap C_B)$, he believes both campaigns. Integrating over the distribution of citizens i (uniform, in this case), gives A his total number of expected votes V_A.[5] V_B is defined similarly. The proportion of non-voters, $P(C_A^C \cup C_B^C)$, matters only for welfare analysis and not for candidates' incentives to prime issues.[6]

3. Candidate campaign strategy

First, transform the platforms (x_A, y_A) and (x_B, y_B) into four intuitive variables:

$$(4)\quad \bar{x} = {}^1\!/_2(x_A + x_B),\ \bar{y} = {}^1\!/_2(y_A + y_B),$$

$$(5)\quad \delta_x = (x_A - x_B),\ \delta_y = (y_B - y_A),$$

where $\bar{x}$ is the average image quality of the candidates, $\bar{y}$ is their average policy position, δ_x is the image advantage of the incumbent, and δ_y is the policy difference between the challenger and incumbent. Another interpretation of $\bar{y}$ is the fraction of citizens that support candidate A's issue position, independent of any other platform characteristics.

Definition 3.1 (Priming)**.** *The incumbent is said to* prime *image over policy if his campaign implies a relative image salience higher than the citizens' pre-campaign relative image salience. That is, $\alpha_A > \beta$. The challenger is said to* prime *policy over image if his campaign implies a relative image salience lower than the citizens' pre-campaign relative image salience. That is, $\alpha_B < \beta$.*

Candidate A's problem is

$$(6)\quad \max_{\{\alpha_A\}} V_A \text{ s.t. } \alpha_A \geq 0.$$

[5]Technically, V_A is stochastic, since each voter believes each campaign with some probability, but if parties are risk neutral in the number of votes they receive, which may not be true (see [Grossman and Helpman, 1996]), e.g., there may be a discrete jump in value from 49% to 50%. With risk neutrality, we can interpret V_A as representing the deterministic proportion of votes out of the total that candidate A wins.

[6]Although it matters indirectly, in the sense that changing salience values may cause a supporter of a candidate to switch from voting to non-voting.

Candidate A, the incumbent, must allocate campaign time and effort among the issues in order to maximize the net benefit from the campaign. Of course, higher salience in a campaign on a relatively popular issue will lead more citizens to vote for A, but less people overall will believe that campaign. Then citizen ι (given salience α) is indifferent between candidate A and candidate B if

$$y_\iota(\alpha) = \bar{y} + \alpha \left(\frac{\delta_x}{\delta_y}\right)(1 - \bar{x}). \tag{7}$$

Call $y_\iota(\alpha)$ the indifferent citizen's ideal policy; knowing this, the number of citizens that vote for A is $y_\iota(\alpha)$, and the number of citizens that vote for B is $(1-y_\iota)$. To get some intuition for the problem, note that the value to A of each citizen $i \in [0, y_\iota(\alpha_A)]$ is $P(C_A)$, and that the total number of those citizens is $y_\iota(\alpha_A)$. Assuming α_A does not affect $P(C_B)$ or $P(C_A \cap C_B)$, then α_A has two effects: changing the intensive margin—for every citizen $i \in [0, y_\iota(\alpha_A)]$, the probability that i votes for A changes by $\partial P(C_A)/\partial \alpha_A$, multiplied by the total number of those citizens, $y_\iota(\alpha_A)$; and the change in the extensive margin—the indifferent citizen i now changes by $\partial y_\iota(\alpha_A)/\partial \alpha_A$, and the probability that citizen votes for A is $P(C_A)$. Formally, the marginal value of α_A is

$$\frac{\partial V_A}{\partial \alpha_A} = \underbrace{\left(\frac{\partial P(C_A)}{\partial \alpha_A}\right) y_\iota(\alpha_A)}_{\text{Change in intensive margin due to } \alpha_A} + \overbrace{P(C_A)\left(\frac{\partial y_\iota(\alpha_A)}{\partial \alpha_A}\right)}^{\text{Change in extensive margin due to } \alpha_A}. \tag{8}$$

So candidate A must tradeoff decreasing the marginal value of each voter, $P(C_A)$ (we will find that $\partial P(C_A)/\partial \alpha_A < 0$ in equilibrium, so that priming more results in less belief), with increasing the total number of citizens that might vote for him, since higher relative image salience will increase his platform advantage (i.e., $\partial y_\iota(\alpha_A)/\partial \alpha_A > 0$).

There are three potential campaign effects to investigate; *direct effects*, *strategic effects*, and *pre-campaign salience effects*. Direct effects are the effects of candidate A's campaign on $P(C_A)$, that is, the campaign salience values α_A affect the probability that each citizen believes that campaign, $P(C_A)$. Strategic effects are the effects of candidate A's campaign on $P(C_B)$ and vice versa. Pre-campaign salience effects are the effects of β on $P(C_A)$, $P(C_B)$ and $P(C_A \cap C_B)$. I start by analyzing a *no effects* structure, in which $P(C_A)$, $P(C_B)$ and $P(C_A \cap C_B)$ are constant to get a general idea of each candidate's incentives to prime, then conclude with a *direct and pre-campaign salience effects* structure, in which $P(C_A)$ depends on α_A and β, but $P(C_A \cap C_B)$ is constant, and thus there is no interaction between α_A and α_B.

3.1. **Candidate behaviour under the *no effects* structure.** In order to isolate and expose the incentives for candidate behaviour, I start with the simplest possible campaign structure, in which there are no direct effects, no strategic effects, and no pre-campaign salience effects. Suppose each citizen has a constant probability of believing any campaign, so that $P(C_A) = P_A$, $P(C_B) = P_B$ and $P(C_A \cap C_B) = P_{AB}$, each one constant. In other words, the campaign has no effect on the probability of each citizen to believe the campaign—this eliminates the incentive for candidates to change salience values to manipulate the intensive marginal value. Since α has no effect on P_A, candidate A's problem is now to change salience values to maximize the number of votes he gets from the constant proportion of citizens that

believe his campaign. Since A has an advantage in the image dimension (i.e., if citizens were polled on that one dimension, every single citizen would prefer A), he can focus his entire campaign on image, $\alpha_A \to \infty$.[7] Since B has a comparative advantage in the policy dimension (since every voter prefers A on the basis of image, it cannot be optimal for B to devote any of his campaign to image), he must choose $\alpha_B = 0$.

Proposition 3.1 (Priming in the *no effects* structure)**.** *If P is constant, then for any parameters $(\beta, \delta_x, \delta_y, \bar{x}, \bar{y})$ the incumbent primes image over policy, and the challenger always primes policy over image. Furthermore, each candidate focuses solely on the issue in which they have a comparative advantage. Formally, $\alpha_A^* \to \infty > \beta$, and $\alpha_B^* = 0 < \beta$.*

Proof. In text. □

3.2. **Candidate behaviour under *direct and pre-campaign salience effects* structure.** The best insight for candidate campaign behaviour is under the *direct and pre-campaign salience effects* structure, in which α_A affects $P(C_A)$ but not $P(C_B)$ or $P(C_A \cap C_B)$, and β affects $P(C_A)$ and $P(C_B)$. In particular, suppose that $P(C_A \cap C_B) = 0$, I write $P(C_A)$ as a function of α_A only,

$$P(\alpha_A) = \left(\frac{\alpha_A}{2\beta}\right) \exp\left(1 - \frac{\alpha_A}{\beta}\right), \tag{9a}$$

$$P(\alpha_B) = \left(\frac{\alpha_B}{2\beta}\right) \exp\left(1 - \frac{\alpha_B}{\beta}\right). \tag{9b}$$

Both $P(\alpha_A)$ and $P(\alpha_B)$ follow gamma distributions with shape parameter $k = 1$ and scale parameter $\theta = \beta$, scaled by $e/2$ (formally, $(2/e)P(C_A) \sim \Gamma(1, \beta)$, and $(2/e)P(C_B) \sim \Gamma(1, \beta)$). The gamma distribution is only approximately R-symmetric, but is the best tradeoff between complexity and accuracy; numerical solutions to the problem using true R-symmetric distributions (e.g., log-normal distributions) follow the same qualitative features of the solution to the problem using gamma distributions. Given pre-campaign salience β, now the probability of citizen belief in candidate A's campaign is maximized at $\alpha_A = \beta$, reflecting the fact that a citizen is most likely to believe a campaign that matches his pre-campaign salience exactly, and decreases as the campaign deviates from that initial salience.

One slight hitch in the analysis: we know from the no effects structure of Section 3.1, candidate A can win the votes of every citizen that believes his campaign by choosing $\alpha_A \to \infty$. But in this campaign structure $P(\alpha_A) = 0$ as $\alpha_A \to \infty$; however, there is a level $\hat{\alpha}_x$ for which A can win every vote from believing citizens and still have citizens left to believe, which provides an upper bound on the optimal salience level α_A. That level is defined by

$$\hat{\alpha} = \frac{\delta_y}{\delta_x}\left(\frac{1 - \bar{y}}{1 - \bar{x}}\right) \tag{10}$$

[7]Strictly speaking, there is a point $\hat{\alpha}$ beyond which the incumbent dominates the election; therefore any $\alpha_A^* \geq \hat{\alpha}$ solves the incumbent's problem (but *not* the challenger's problem), but setting $\alpha_{yA} = 0$ (i.e., $\alpha_A = \infty$) makes the argument clearer.

Since V_A is strictly concave in α_A and $\alpha_A \in [0, \hat{\alpha}]$, the candidate's problem has a unique solution. Candidate A's problem is

$$\max_{\{\alpha_A\}} \left[P(\alpha_A) y_\iota(\alpha_A) + P(\alpha_B) y_\iota(\alpha_B) \right] \text{ s.t. } 0 \leq \alpha_A \leq \hat{\alpha} \tag{11}$$

Candidate A's optimal strategy is

$$\alpha_A^* = \beta - \frac{1}{2}\left(\frac{\delta_y \bar{y}}{\delta_x(1-\bar{x})}\right) + \frac{1}{2}\sqrt{4\beta^2 + \left(\frac{\delta_y \bar{y}}{\delta_x(1-\bar{x})}\right)^2}, \tag{12}$$

If the upper bound constraint $\alpha_A \leq \hat{\alpha}$ binds, then candidate A's optimal strategy is exactly $\alpha_A^* = \hat{\alpha}$. Candidate B's problem is similar,

$$\max_{\{\alpha_B\}} \left[P(\alpha_A)(1 - y_\iota(\alpha_A)) + P(\alpha_B)(1 - y_\iota(\alpha_B)) \right] \text{ s.t. } 0 \leq \alpha_B \leq \hat{\alpha}, \tag{13}$$

which makes candidate B's optimal strategy

$$\alpha_B^* = \beta - \frac{1}{2}\left(\frac{\delta_y \bar{y}}{\delta_x(1-\bar{x})}\right) - \frac{1}{2}\sqrt{4\beta^2 - \left(\frac{\delta_y \bar{y}}{\delta_x(1-\bar{x})}\right)^2}. \tag{14}$$

Proposition 3.2 (Priming in the *direct and pre-campaign salience effects* structure)**.** *If P is defined by Equations* (9a)-(9b)*, then for any parameters $(\beta, \delta_x, \delta_y, \bar{x}, \bar{y})$ that satisfy $\hat{\alpha}_x > \beta$, candidate A always primes image over policy, and candidate B always primes policy over image. That is, $\alpha_A^* > \beta$, and $\alpha_B^* < \beta$.*

Proof. See appendix. □

3.2.1. *Comparative statics of α_A under the* direct and pre-campaign salience effects *structure.* Recall the definitions for average image quality $\bar{x}$ and δ_x; since we would like to understand when there's a marginal increase in image quality for each candidate individually, I will switch from these parameters back to individual image quality x_A and x_B. Thus I will give comparative static analysis of equilibrium priming behaviour as a function of the parameters $(\beta, x_A, x_B, \bar{y}, \delta_y)$.

First, an increase in β increases both α_A^* and α_B^*—each candidate needs to roughly follow public opinion on salient issues. For example, if the economy were slumping, pre-campaign salience for that issue would rise, and the candidates would not ignore it. However, since priming is defined relative to β, each candidate actually primes relatively more after the change. That is, a one unit increase in β results in a more than one unit increase in α_A^*, and a less than one unit increase in α_B^*, suggesting that although they respond to public opinion, they do not follow it exactly. Next, how does priming strategy change as each platform parameter changes?

Remark 3.3 (Priming comparative statics)**.** *Given parameters $(\beta, \delta_x, \delta_y, \bar{x}, \bar{y})$, the following comparative static results hold: an increase in x_A increases priming for both candidates; an increase in x_B decreases priming for both candidates; an increase in δ_y decreases priming for both candidates; and an increase in $\bar{y}$ decreases priming for the incumbent, but increases priming for the challenger.*

The intuition for the effects of image quality on equilibrium strategy are intuitive: given that the incumbent is priming image and the challenger is priming policy, an increase in the incumbent's image quality leads both candidates to further prime those issues, for the same reason they did so in the first place. When the challenger's image quality increases, each candidate gets less benefit from priming, because the challenger doesn't look as bad in comparison.

The intuition for the comparative statics of policy are complex, but similar for each parameter. We want to know how the marginal value of V_A due to α_A changes as each parameter changes. First, suppose $\bar{y}$ increases a little bit, then the changes in marginal value of V_A and V_B due to α_A and α_B (i.e., the cross partial derivative of V_A with respect to α_A and $\bar{y}$) are[8]

$$\frac{\partial^2 V_A}{\partial \alpha_A \partial \bar{y}} = P'_A, \qquad \frac{\partial^2 V_B}{\partial \alpha_B \partial \bar{y}} = -P'_B, \tag{15}$$

which means the effect of a marginal change in the average policy position is only the marginal change in probability of citizen belief. Since $\alpha_A^* > \beta > \alpha_B^*$ in equilibrium, implying $P'_A < 0 < P'_B$, Equations (15) imply that both α_A^* and α_B^* decrease; because the way $\bar{y}$ enters into the indifferent citizen's ideal policy $y_\iota(\alpha)$ (Equation (7)) affects only the intensive margin, the change in probability due to α_A is the only effect that results from a change in $\bar{y}$. In other words, candidate A decreases his priming strategy α_A because the change in $\bar{y}$ increased the cost of losing value at the intensive margin, but did not change any other factor in his decision.

$$\frac{\partial^2 V_A}{\partial \alpha_A \partial \delta_y} = P'_A \frac{\partial y_\iota}{\partial \delta_y} + P_A \frac{\partial^2 y_\iota}{\partial \alpha_A \partial \delta_y}, \qquad \frac{\partial^2 V_B}{\partial \alpha_B \partial \delta_y} = -P'_B \frac{\partial y_\iota}{\partial \delta_y} - P_B \frac{\partial^2 y_\iota}{\partial \alpha_B \partial \delta_y}. \tag{16}$$

Let us analyze the change in the incumbent's marginal value of V_A with respect to α_A. First, consider the change in the value of the intensive margin (the first term)[9]: since δ_y decreases y_ι, and $P'_A < 0$ at α_A^*, the incumbent gains value on the intensive margin, because he loses less probability of belief if he increases α_A^*, since the marginal indifferent citizen decreases. Next, the change in the value of the extensive margin: again, δ_y only affects the indifferent citizen, so the marginal probability of belief of any citizen does not change. Since the marginal change in the indifferent citizen due to α_A is decreasing in δ_y, the value of the extensive margin is decreasing in δ_y, and, at equilibrium level α_A^*, the loss in the value of the extensive margin outweighs the gain in the value of the intensive margin. So α_A^* is decreasing in δ_y. Similar analysis shows α_B^* is increasing in δ_y. Therefore both candidates prime less as the policy difference increases.

The punchline: if the incumbent's image quality increases (or the challenger's image quality decreases), the incumbent's comparative advantage in image increases, and the challenger's decreases, so the incumbent should focus more on image and the challenger less. If the policy difference increases, each candidate loses benefit at the extensive margin, and must pull back gains from the intensive margin by returning salience levels closer to the

[8]For more compact notation, I write P'_A for $\partial P(\alpha_A)/\partial \alpha_A$, and P'_B similarly.

[9]Remember, we are talking about marginal changes in marginal values; instead of doing comparative statics on equilibrium outcomes, we are interested in the comparative statics of behaviour, and so we must consider how a change in a parameter affects the marginal benefits and costs of each candidate's decision.

citizens' pre-campaign salience. If the average policy increases, the incumbent can reduce priming to gain value on the intensive margin, because he loses less votes by decreasing the extensive margin after the average policy increases.

4. Conclusion

In a two-candidate election over image and policy with campaign effects, the incumbent always primes image over policy, and the challenger always primes policy over image, in keeping with empirical results [Druckman et al., 2009]. In addition, image quality affects equilibrium priming behaviour in intuitive ways: if an incumbent's image quality increases, or the challenger's decreases, the incumbent will focus more on image and the challenger will focus more on policy.

The next step in this line of research is to test the empirical implications of the model's comparative statics; the generally accepted method for determining priming behaviour during elections is content analysis (although many researchers use experimental analysis to determine effects outside of real-world campaigns [Barker, 2005, Nelson and Oxley, 1999]), usually of speeches [Druckman, 2011], websites [Druckman et al., 2009] or television ads [Kaplan et al., 2006]; the other parameters in this model can be measured via poll or survey, resulting in many opportunities for testing the implications.

Due to the simplicity of the model and relation to the standard spatial voting framework, there are many ways to adapt and extend the model to other electoral situations; including three or more parties (in order to test the model with Canadian data, and possibly add to existing studies of Canadian campaign behaviour [Johnston et al., 1992, Mendelsohn, 1996]), including media-candidate-voter interaction, adding three or more issues, or including pliable policies, campaign contributions and special interest groups [Grossman and Helpman, 1996].

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